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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/570,643

03/30/2006

Dirk Zierer

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07/30/2009

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EXAMINER

BUTTNER, DAVID J

ART UNIT

PAPER NUMBER

1796

MAIL DATE

DELIVERY MODE

07/30/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

## Application No.

10/570,643

## Applicant(s)

ZIERER ET AL.

## Examiner

David Buttner

## Art Unit

1796

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 03 June 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-25, 28 and 30-36 is/are pending in the application.
- 4a) Of the above claim(s) 9-11, 15-25, 33, 34 and 36 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8, 12-14, 28, 30-32 and 35 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 6/8/06
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

The lined out reference on the 1449 form is not in the English language, not provided with any English explanation and not described in the specification.

Applicant's election with traverse of Group I and the species of polyester as "D" and diphenylcarbonate as the linking group between the polyoxymethylene block and polyester block in the reply filed on 6/3/09 is acknowledged. The traversal is on the ground(s) that there is no serious burden on the examiner to examine all the claims. This is not found persuasive because the wide variety of possible blocks "D" claimed by applicant present a large burden. Some of the blocks are condensation polymers (eg polyesters) while some are from unsaturated monomers (eg polybutadiene). Applicant does not admit any of the claimed species of "D" are obvious over one another. The same can be said of the choices of linker – carbonate linkages are different from amide or ester linkages. Applicant does not admit the methods of forming the block polymer are obvious from the block polymer itself.

Claims 9-11,33 and 34 require a "D" different from polyester. Claims 15-18 require linking groups different from diphenylcarbonate. Claims 1-8,12-14,28,30-32 and 35 read on the elected invention and read on the elected species.

The requirement is still deemed proper and is therefore made FINAL.

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

Applicant must provide a proper abstract with the next response. This is the second notification.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 13, 14 and 32 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is not seen how dianhydrides or diimides of tetracarboxylic acids could result in the  $-X-CO-(R_2-CO)_m-X-$  structure of Claim 13 when  $R_2$  is limited to the specified hydrocarbon radicals of claim 1.

Claim 14 cannot depend on itself.

Claim 14 could not have  $-(R_2-CO)-$  be present if derived from a diester of carbonic acid such as diphenylcarbonate.

Claim 32 fails to list any step and therefore cannot constitute a "method".

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

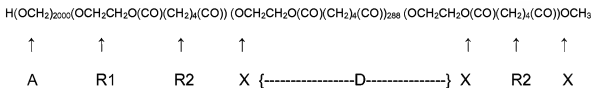
The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1,3-8,12,13 and 30-32 rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over JP04114022.

The reference pictures a block polymer having polyoxymethylene units and polyethylenedipate polyester units (page 8 lower left). The structure corresponds to applicant's formula as follows:



Not only polyoxymethylene, but copolymers of oxymethylene units and ethylene oxide units can employed (see abstract; page 9 upper left).

Claims 1-8,12,13 and 30-32 rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Matsuzaki 4535127.

Matsuzaki exemplifies (#46) the production of a block polymer having a blocks of copolyoxymethylene from trioxane and ethyleneglycol formal (ie dioxolane) and a hydroxyl/carboxyl terminated polyesterurethane block from

Art Unit: 1796

dicyclohexylmethanediisocyanate + ethyleneglycol + polyethylenedipate. The starting polyesterurethane block polymer must have one of the two structure as follows:

(I)



(II)



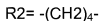
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Upon reaction with the trioxane and ethyleneglycol formal the following results for (I):

(I)



This fits applicant's formula with "A"= copolyoxymethylene



X=oxygen

m=1

D=polyesterurethane

Similarly for (II):

Copolyoxymethylene-OCH<sub>2</sub>CH<sub>2</sub>-O(CO)NH- polyesterurethane-O(CO)X(CH<sub>2</sub>)<sub>4</sub>(CO)O-copolyoxymethylene

This fits applicant's formula with "A"= copolyoxymethylene

R1= -CH<sub>2</sub>CH<sub>2</sub>-

m=0 at left side of molecule

m=1 at right side of molecule

R2= -(CH<sub>2</sub>)<sub>4</sub>-

X=nitrogen at left side of molecule

X= oxygen at right side of molecule

D=polyesterurethane

Claims 1-8,12,13,28 and 30-32 rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuzaki '127 in combination with JP60170652.

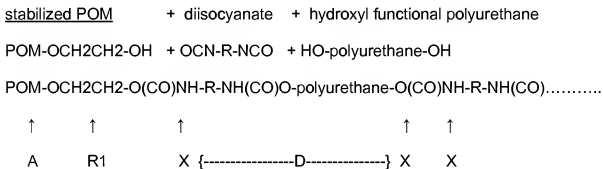
Matsuzaki teaches the claimed block polymer as explained above. Matsuzaki does not suggest adding this block polymer to polyoxymethylene.

JP60170652 teaches triblock polymers of polyoxymethylene blocks and elastomeric blocks can be added to polyacetal (ie polyoxymethylene) to improve toughness. Matsuzaki's block polymer appears to correspond closely to that of JP60170652.

It would have been obvious to combine polyoxymethylene with Matsuzaki's block polymer for the expected improved toughness.

Claims 1-6,8 and 30-32 rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Halek 3364157.

Halek teaches coupling oxymethylene polymers to other polymers via diisocyanate coupling agents (title). Halek (col 3 line 48-52) states the oxymethylene polymer may be a stabilized oxymethylene polymer made by degrading a oxymethylene copolymer down to a stable terminal carbon-to-carbon linkage. This is also the technique applicant uses to place HO-CH<sub>2</sub>CH<sub>2</sub>- at the end of the oxymethylene polymer (page 9 line 2-5 of spec). When the other polymer is a polyurethane (col 4 line 60), the resulting block polymer corresponds to applicant's formula as follows:



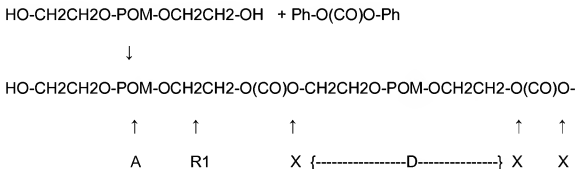
Claims 1-8,13,14,30-32 and 35 rejected under 35 U.S.C. 103(a) as being unpatentable over Konig 4267303 in view of Smith 3505292.

Konig suggests polycarbonates having repeating units of  $[-\text{O-A-O-(CO)}]_n$ - (formulas Ia-Ii). "A" can be a polyacetal diol (col 6 line 7) formed from formaldehyde (ie a polyoxymethylene). The carbonate units can be provided by diphenylcarbonate (col 3



line 53). König does not suggest that the starting polyoxymethylene have a terminal –CH<sub>2</sub>CH<sub>2</sub>-OH.

Smith 3505292 (col 6 line 53-71) explains the well known technique placing oxyethylene units at the end of a polyoxymethylene polymer through hydrolysis. This protects the internal oxymethylene units. Utilizing such a oxyethylene terminated polyoxymethylene to make König's polycarbonate, the reaction would be:



With m=0 and D being a polyacetal

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Buttner whose telephone number is 571-272-1084. The examiner can normally be reached on weekdays from 10 to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jim Seidleck, can be reached on 571-272-1078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

Art Unit: 1796

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

David Buttner

7/23/09

/David Buttner/

Primary Examiner, Art Unit 1796